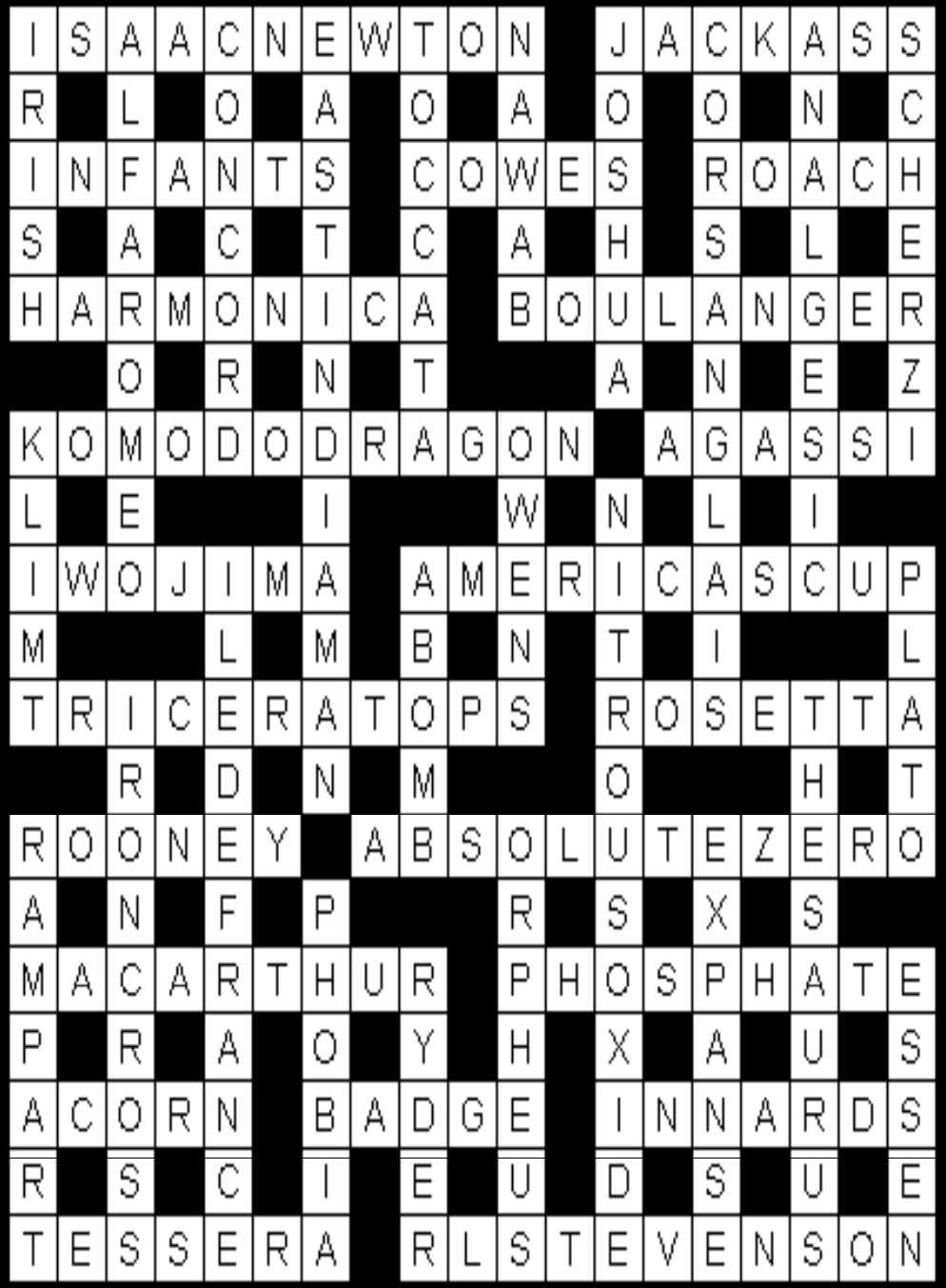
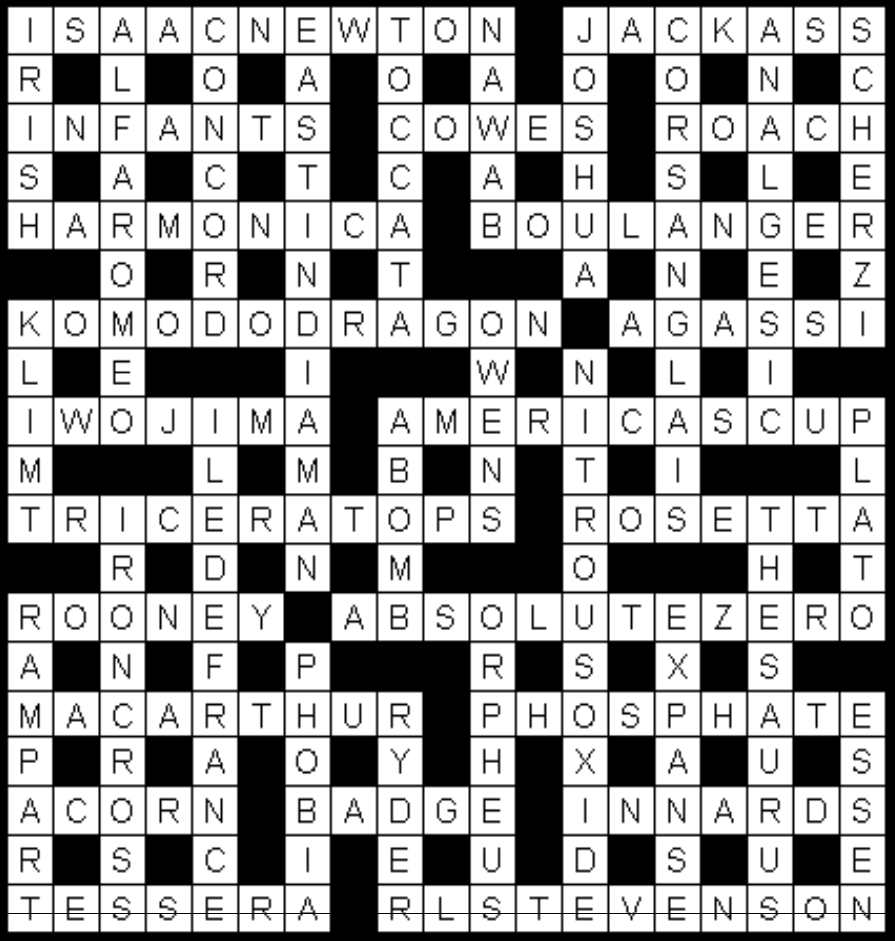
GENERAL KNOWLEDGE



What is Semantic Knowledge?

- Our organized knowledge of the world
- It includes:
  - Lexical knowledge
  - Conceptual knowledge
- Essential components are:
  - Categories
  - Concepts



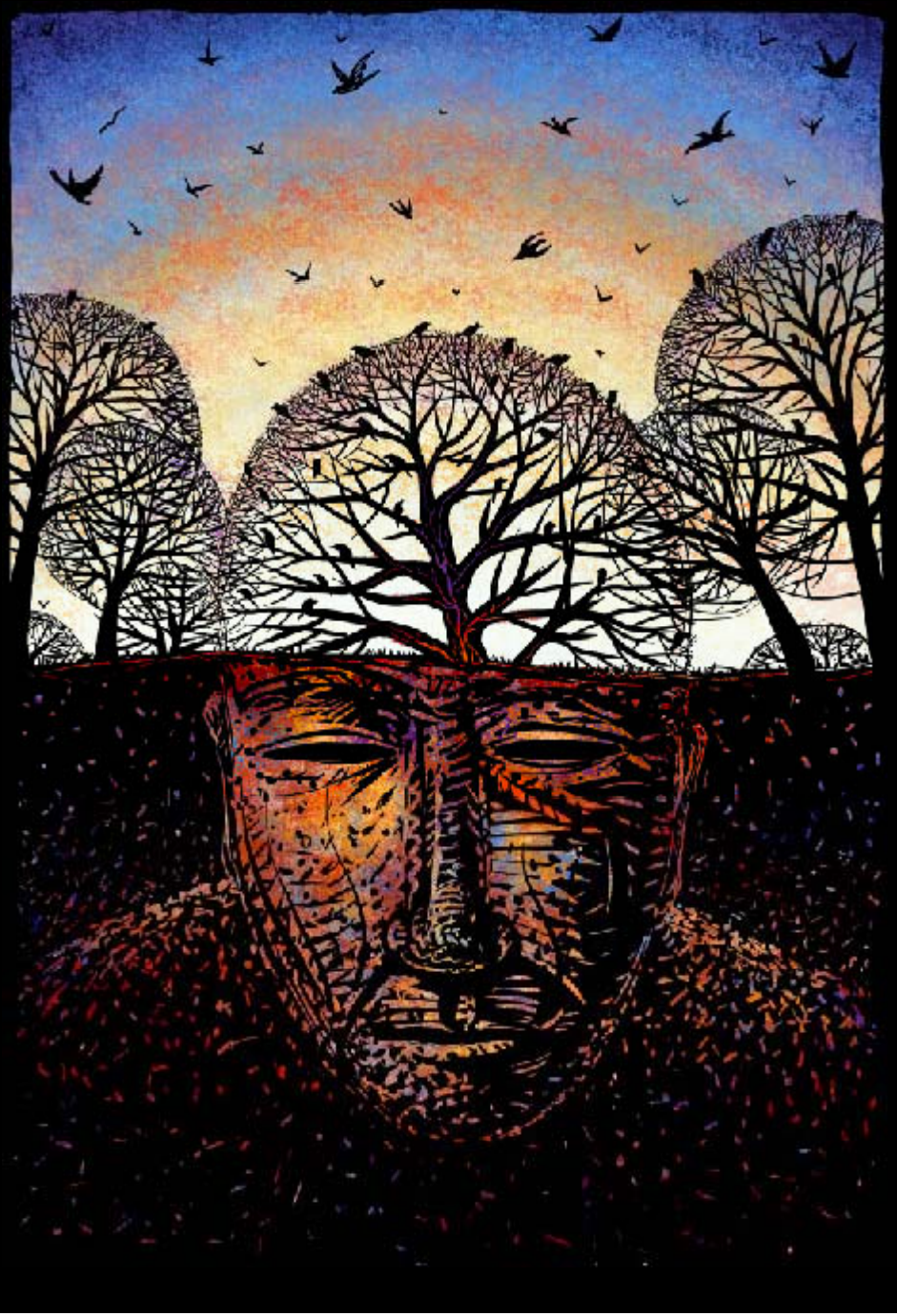
Categories

- Class of objects that belong together

- Example:
  - Fruits
  - Furniture
  - Junk food
  - Sports
  - Etc…

Concepts

- Our *mental representation* of a category that can include abstracted properties or attributes of objects or events
- Examples:
  - Love
  - Peace
  - Freedom



Models of Semantic Memory

- Feature Comparison Model
- Prototype Model
- Exemplar Model
- Network Models
  - Semantic Network
  - Parallel Distributed Processing

Feature Comparison Model (FCM)

- Concepts are stored in memory according to a *list of features* or *characteristics*

- EXP: Cat
  - Has fur
  - Four legs
  - Tail
  - Hates water
  - Chases mouse

Feature Comparison Model (FCM)

- Assumptions of FCM:
  - Based on abstractions NOT on specific examples
  - Membership is clear-cut
  - All members are created equal

Problems with FCM

- Hard to make clear-cut boundaries
  - Fruits and vegetables
- Not all members are equal
  - Robin vs. penguin

Exemplar Model

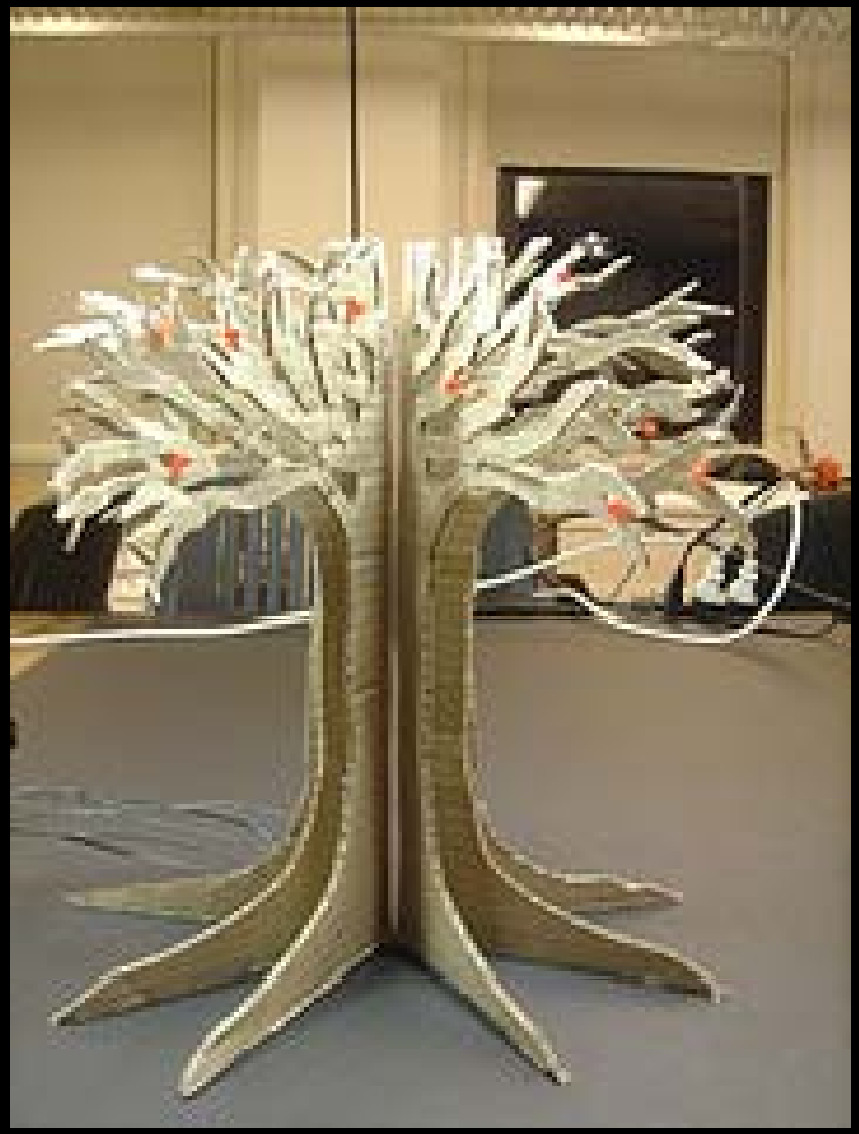
- We store every exemplar of a category in our memory, and compare them to the new one's to decide on membership

Problems with Exemplar Model

- Takes up space
- Not efficient
- Leads to stereotypes if you do not have enough exemplars of a category

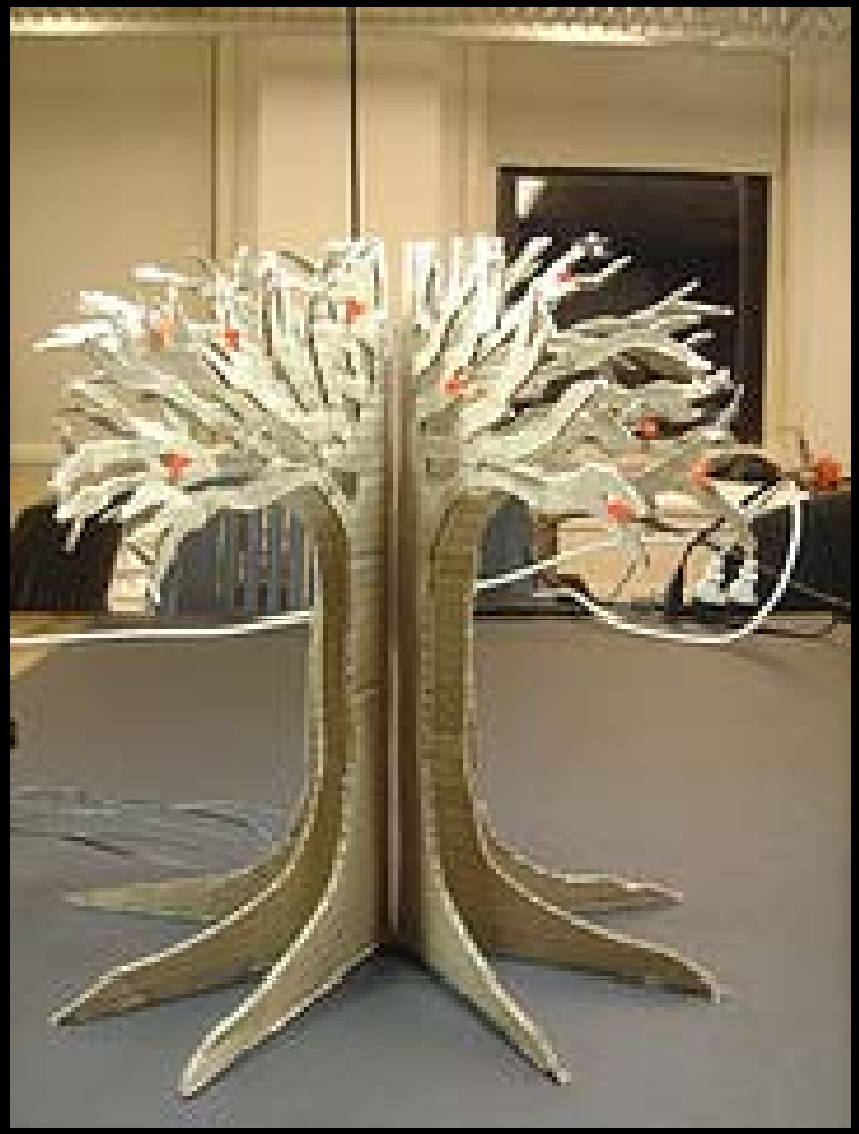
Prototype Model

- What is a prototype?
  - An idealized item that is most common, typical or representative of a category
  - It needn't exist in reality



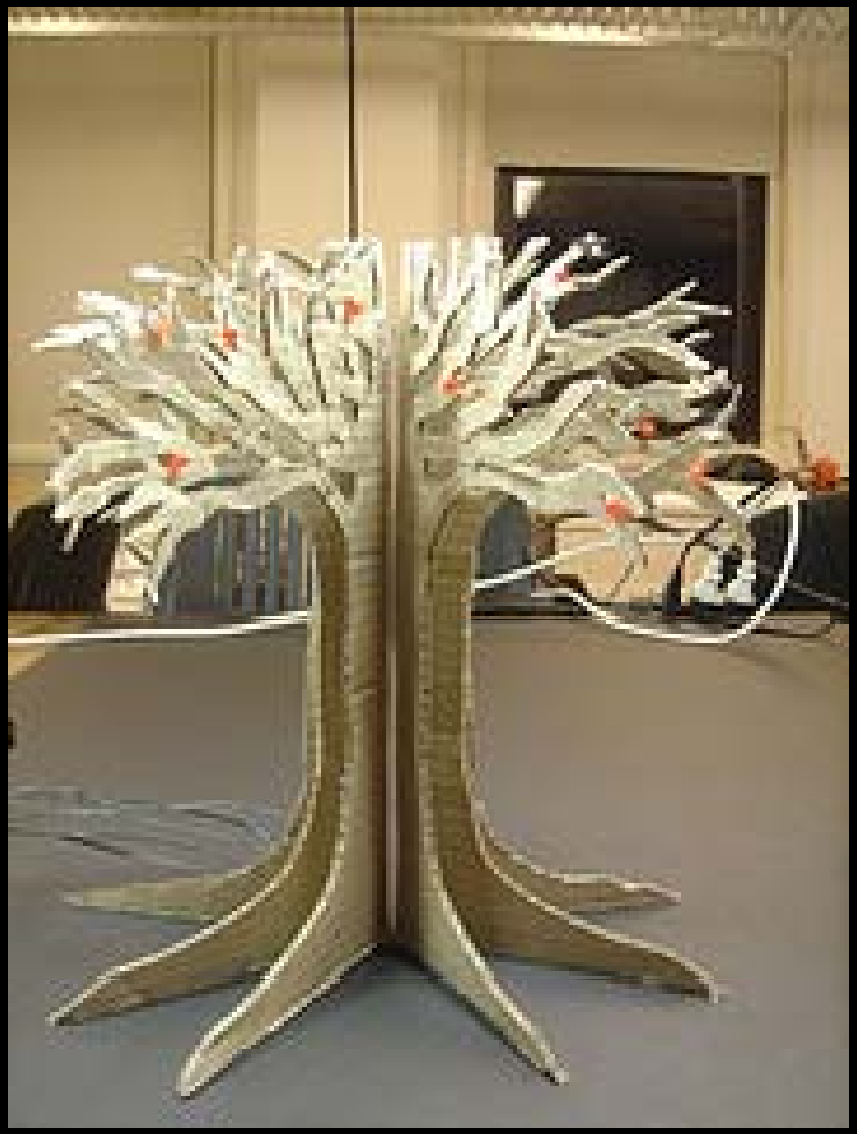
Prototype Model

- Prototype:
  - good example of a category
  - respond better to priming effects



Prototype Model

- Abstraction rather than examples.
- Assumes that categories have *degree* of membership
- No clear-cut boundaries
- Members are not equal



Wittgenstein

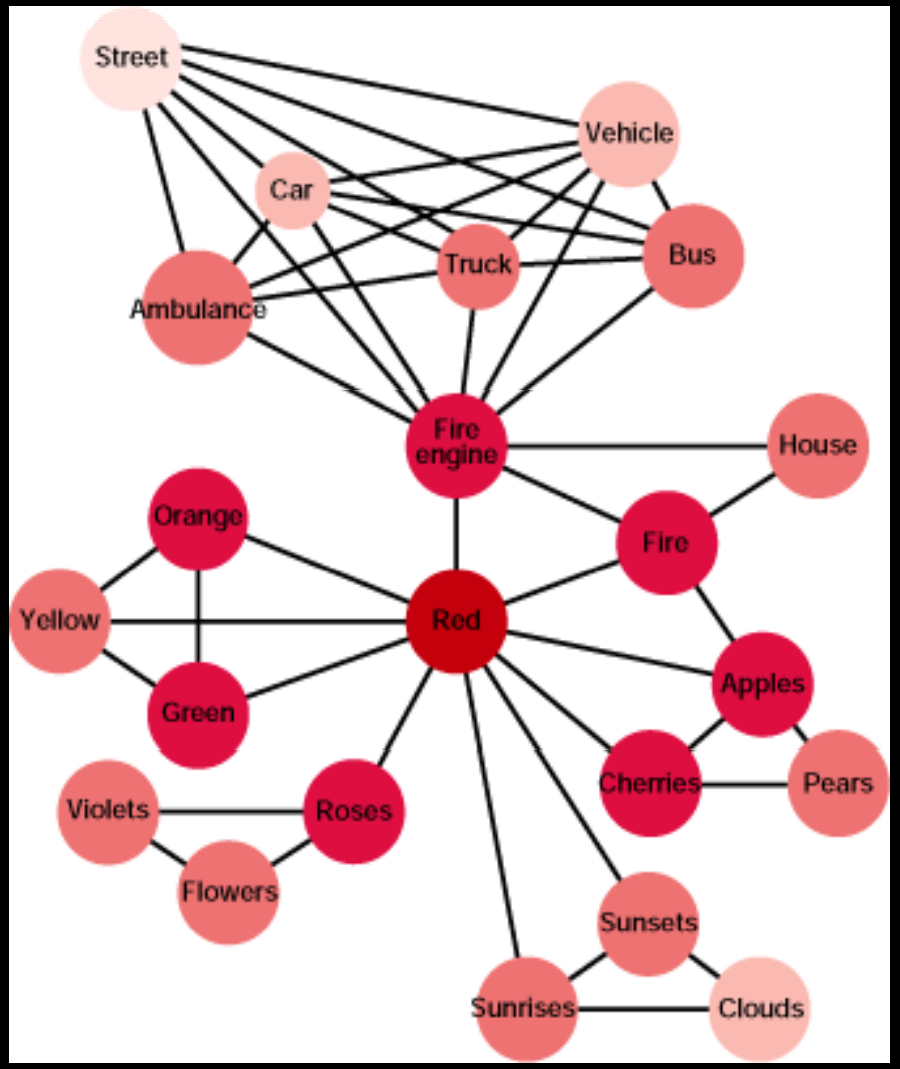
- **How do you define the category of GAMES?**
  - What is common in games such as football, chess, tennis, solitaire, hide-and-seek, poker etc?
  - Family resemblance

Levels of Categorization

- Superordinate-level:
  - furniture
- Basic-level:
  - chair
- Subordinate-level:
  - rocking chair

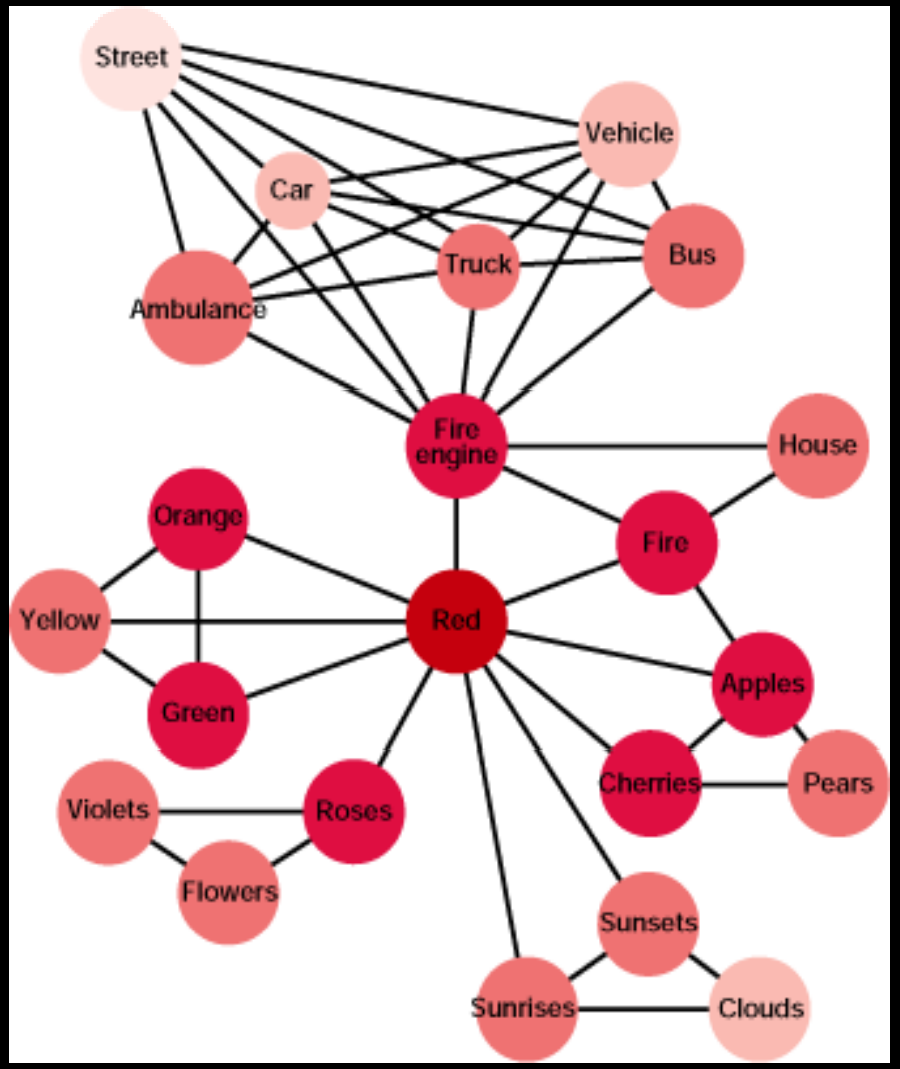
Network Models

- Your knowledge about the world in an organized network of concepts



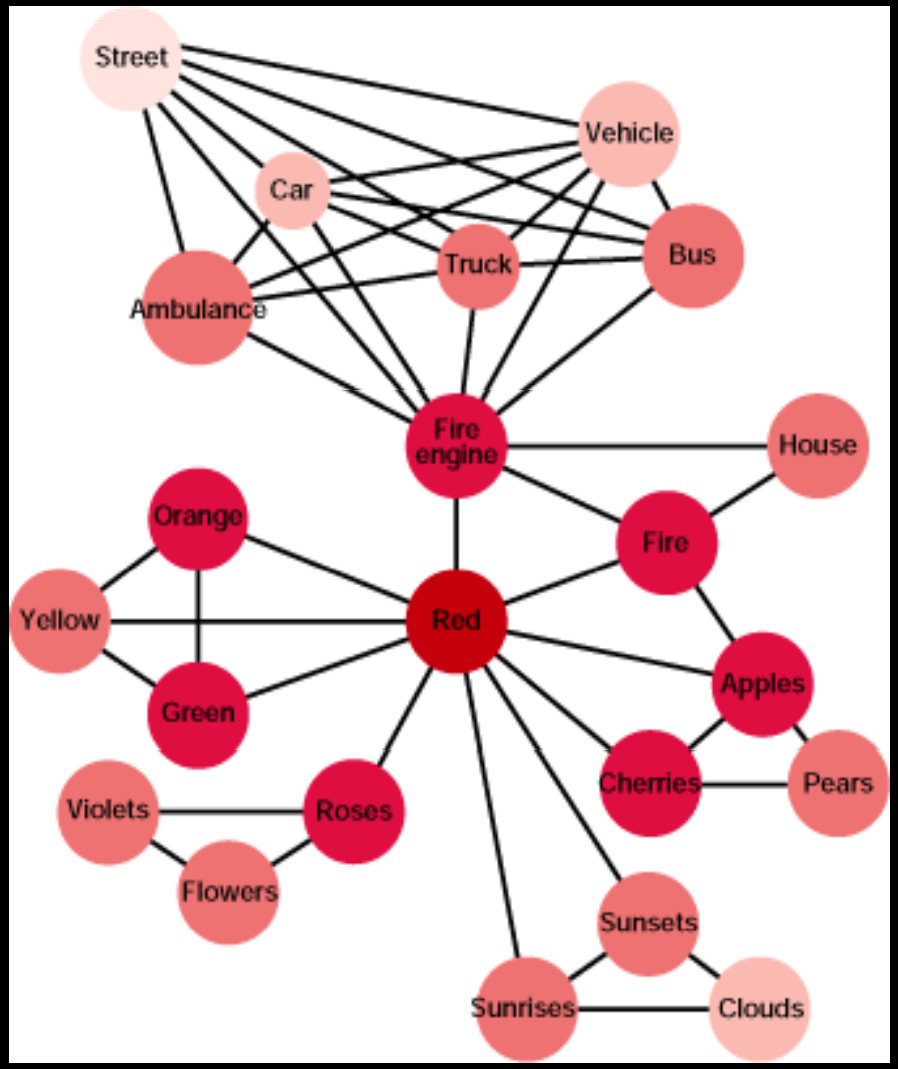
Collins and Loftus (1975)

- Nodes
- Links
- Spreading Activation
  - Activation spreads though the links from one node to another



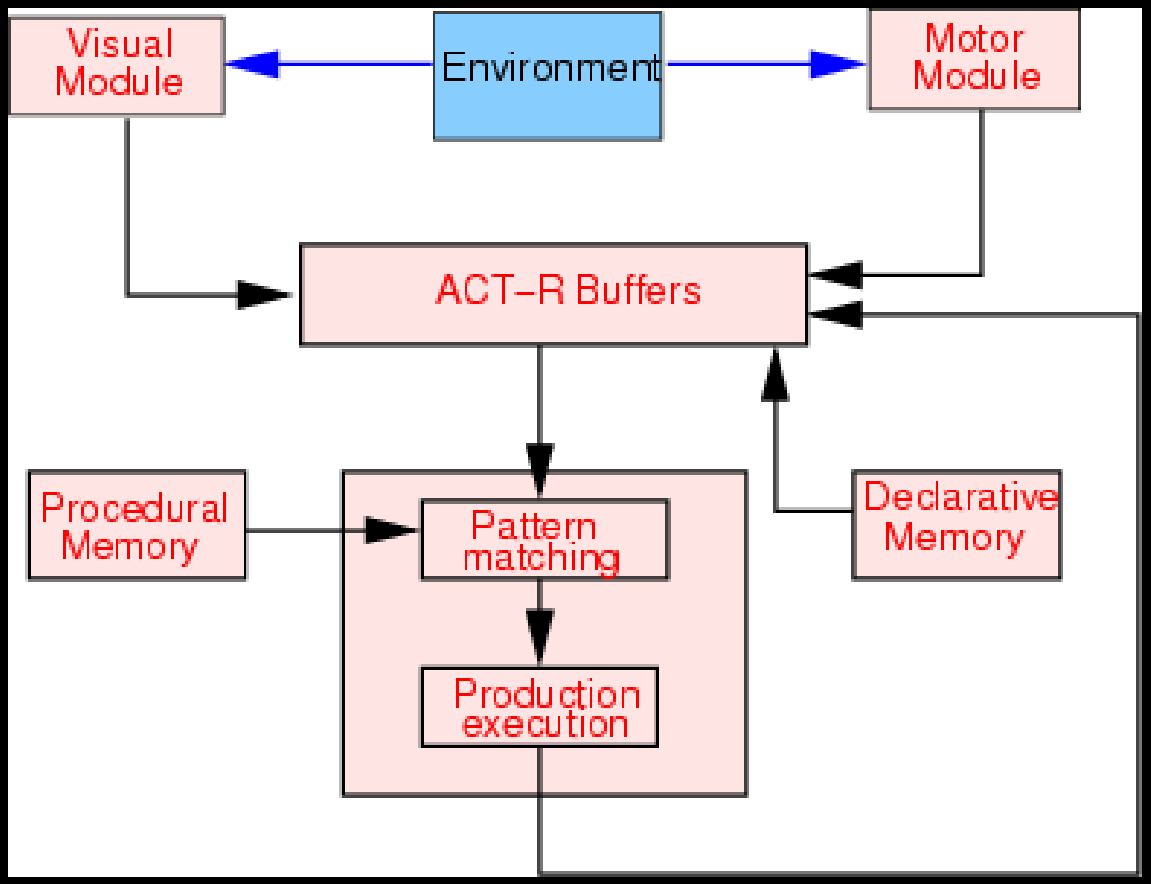
Collins and Loftus (1975)

- Frequently used links have greater strength
  - Can account for the typicality effect



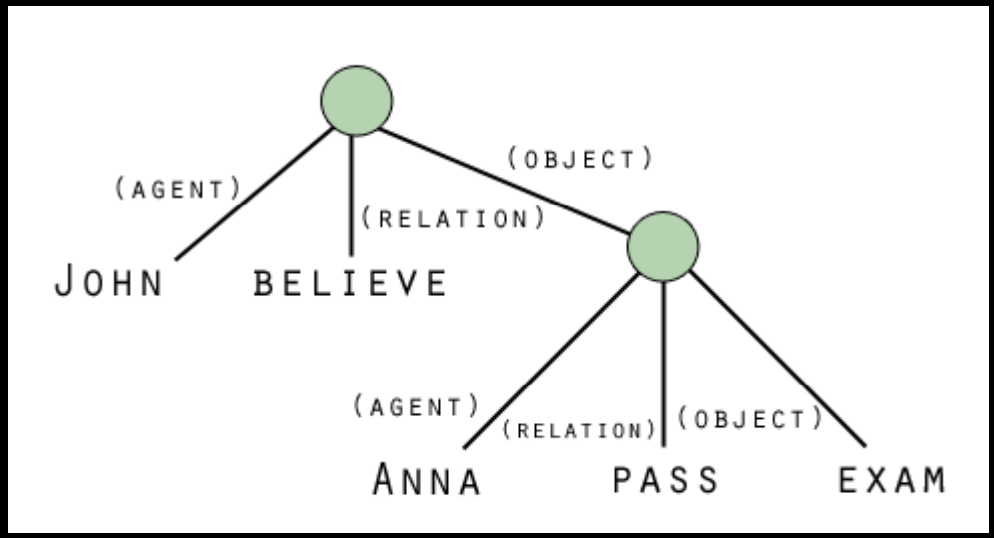
Anderson ACT-R (1983)

- ACT: Adaptive Control of Thought
  - Memory
  - Learning
  - Spatial cognition
  - Language
  - Reasoning
  - Decision making



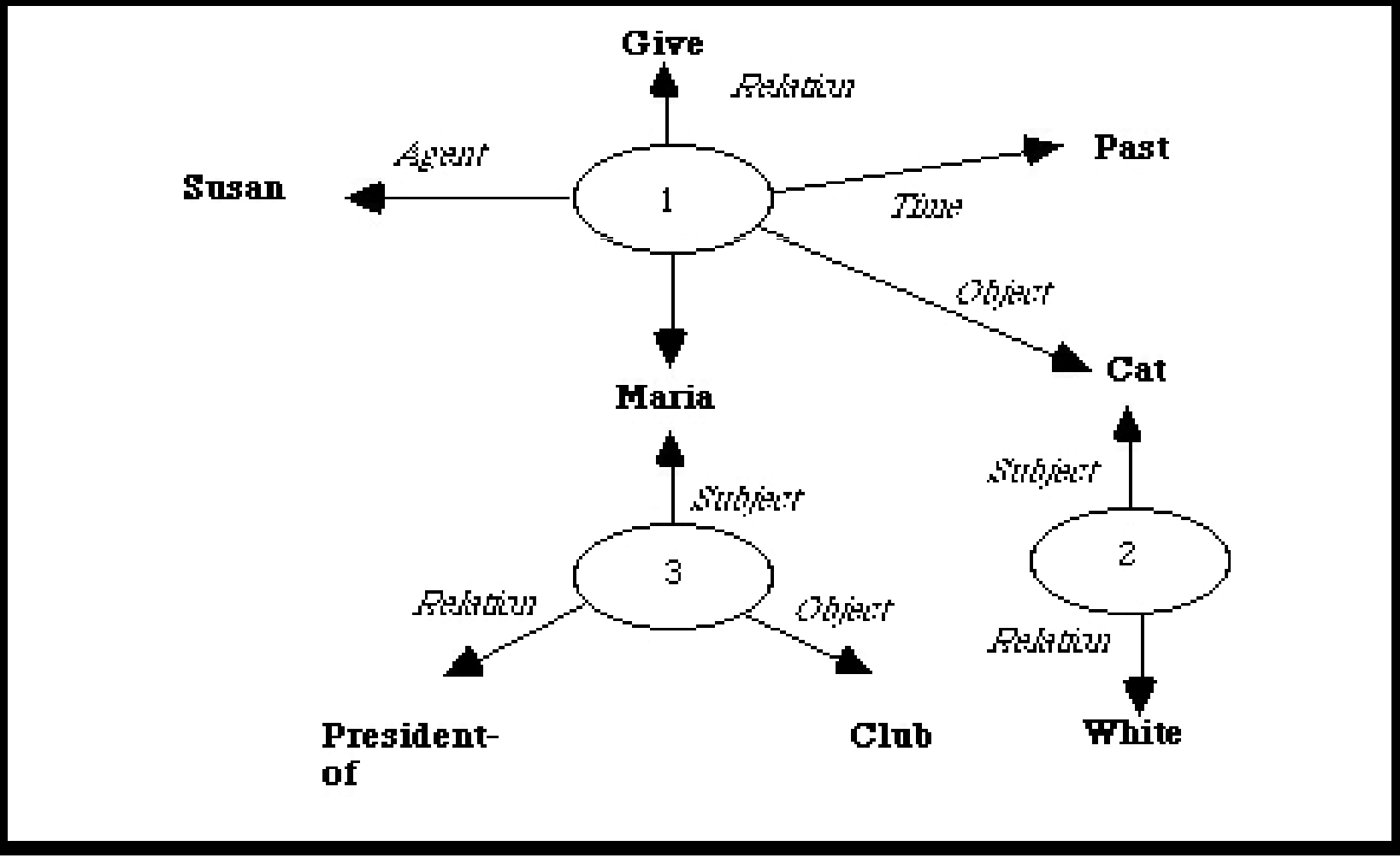
Anderson ACT-R (1983)

- Meaning is represented in a *propositional network*
- ***Proposition:*** smallest unit of knowledge that can be judged either true of false.



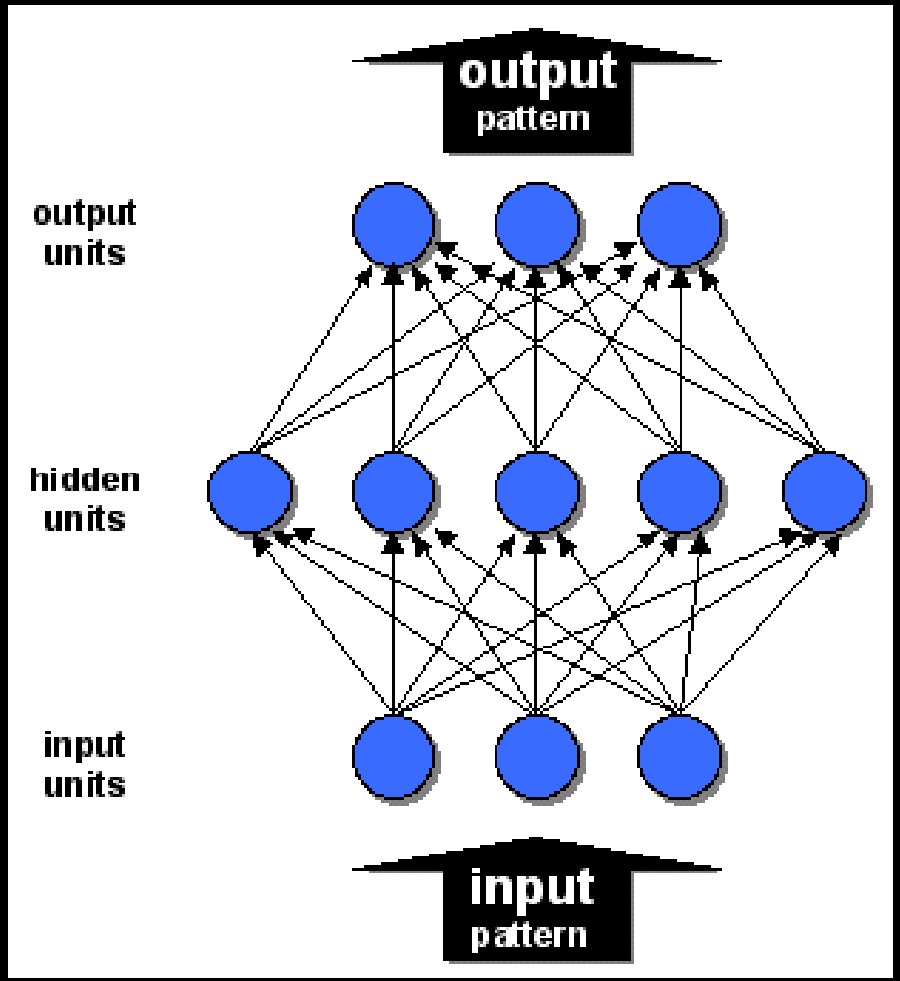
Anderson ACT-R (1983)

- Susan gave a white cat to Maria, who is the president of the Club



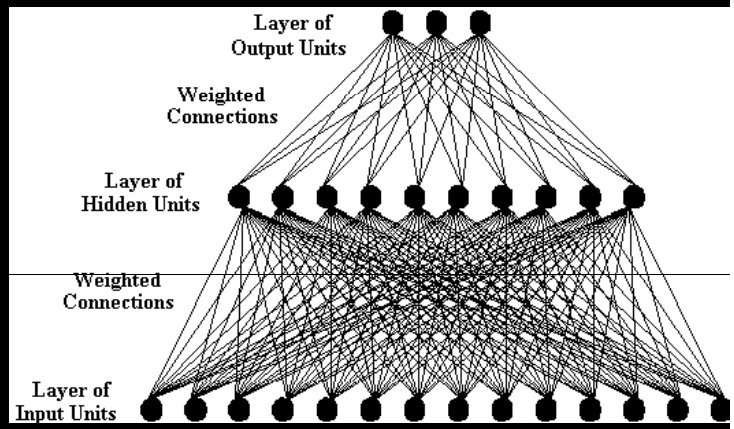
Parallel Distributed Processing Connectionism

- Activation flows through a network of nodes.
- Artificial Neural Network
  - Simulates a neural network



Parallel Distributed Processing

- Parallel Search:
- Knowledge is distributed, it IS the connections between the nodes.
- Cognition can be explained by the connections between the nodes
- Connectionist weights determine the strength of the connections
  - Every experience changes the weights/strengths of the connections
- Memory can still work well with faulty input
- Some clues are more effective then others
- Spontaneous generalization
  - Explains stereotypes



SCHEMAS AND SCRIPTS

Schemas

"The procedure is actually quite simple. First you arrange the items into different groups. Of course one pile may be sufficient depending on how much there is to do. If you have to go somewhere else due to lack of facilities that is the next step; otherwise, you are pretty well set. It is important not to overdo things. That is, it is better to do too few things at once than too many. In the short run this may not seem important but complications can easily arise. A mistake can be expensive as well. At first, the whole procedure will seem complicated. Soon, however, it will become just another facet of life. It is difficult to foresee any end to the necessity for this task in the immediate future, but then, one never can tell. After the procedure is completed one arranges the materials into different groups again. Then they can be put into their appropriate places. Eventually they will be used once more and the whole cycle will then have to be repeated. However, that is part of life."

Bransford and Franks (1972)

WASHING CLOTHES

"The procedure is actually quite simple. First you arrange the items into different groups. Of course one pile may be sufficient depending on how much there is to do. If you have to go somewhere else due to lack of facilities that is the next step; otherwise, you are pretty well set. It is important not to overdo things. That is, it is better to do too few things at once than too many. In the short run this may not seem important but complications can easily arise. A mistake can be expensive as well. At first, the whole procedure will seem complicated. Soon, however, it will become just another facet of life. It is difficult to foresee any end to the necessity for this task in the immediate future, but then, one never can tell. After the procedure is completed one arranges the materials into different groups again. Then they can be put into their appropriate places. Eventually they will be used once more and the whole cycle will then have to be repeated. However, that is part of life."

Schema

- Generalized knowledge about a situation or an event
- Helps explain how we deal with novel and complex situations and events

Schemas

- Organize our knowledge
- May include other schemas
- Help in encoding, storage, and recall
- Allows us to make inferences

Schemas: Bartlett

One night two young men from Egulac went down to the river to hunt seals and while they were there it became foggy and calm. Then they heard war-cries, and they thought: "Maybe this is a war-party". They escaped to the shore, and hid behind a log. Now canoes came up, and they heard the noise of paddles, and saw one canoe coming up to them. There were five men in the canoe, and they said: "What do you think? We wish to take you along. We are going up the river to make war on the people." One of the young men said," I have no arrows." "Arrows are in the canoe," they said. "I will not go along. I might be killed. My relatives do not know where I have gone. But you," he said, turning to the other, "may go with them." So one of the young men went, but the other returned home. And the warriors went on up the river to a town on the other side of Kalama. The people came down to the water and they began to fight, and many were killed. But presently the young man heard one of the warriors say, "Quick, let us go home: that Indian has been hit." Now he thought: "Oh, they are ghosts." He did not feel sick, but they said he had been shot. So the canoes went back to Egulac and the young man went ashore to his house and made a fire. And he told everybody and said: "Behold I accompanied the ghosts, and we went to fight. Many of our fellows were killed, and many of those who attacked us were killed. They said I was hit, and I did not feel sick." He told it all, and then he became quiet. When the sun rose he fell down. Something black came out of his mouth. His face became contorted. The people jumped up and cried. He was dead.

Schemas: Bartlett

- **Results:**
  - Story got shorter
  - got more coherent
  - fit to the culture of the person
  - fit to personal point of view
- **Conclusion:**
  - Memories are stored using existing knowledge, which is represented by schemas.

Bower, Black, & Turner (1979)

- Participants read 18 stories
- 1, 2, or 3 stories read about each schema
  - 1 story about going to the doctor
  - 1 story about going to the dentist
  - Health care schema activated for both

Bower, Black, & Turner (1979)

- Participants then asked if 3 particular types of events happened in the stories
  - Events actually in stories
  - Events consistent with schemas, but not actually in stories
  - Novel, unrelated events
- Participants also rated their level of confidence about each of their answers

Bower, Black, & Turner (1979) Results

- Participants were confident
  - About the actual events that they did read
  - About schema-consistent events not actually in story
- The more stories read about a certain schema, the more confidence that the schema-consistent event was in a story
- Implications of the results
  - Ideas contained in the schema become a part of the memory with items and events actually experienced

Scripts

- Type of schema about events
- Structure captures general information about routine events
  - Eating in a restaurant, attending a movie, a visiting a doctor's office
- Scripts have typical roles
  - (Customers, waiter, cook), (ticket vendor, patrons, refreshments), (doctor, nurse, patient)

Scripts

- When we hear or read about a scripted event, our knowledge of the entire script is activated
- We can fill in or infer the scenes and actions that are not explicitly mentioned.


Viewer
THE END